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(21) International Application Number: PCT/US93/02782 (22) International Filing Date: 25 March 1993 (25.03.93) (30) Priority data: 07/869,994 16 April 1992 (16.04.92) US (71) Applicant: THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US). (72) Inventors: PATTERSON, Thomas, Sebastian ; 60 Bishops Gate Drive, Cincinnati, OH 45246 (US). CEDENO, Alejandro ; 2028 Madison Rd. #3, Cincinnati, OH 45208 (US). DUVALL, John, George ; 731 Sanders Drive, Hamilton, OH 45013 (US).	(74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45202 (US). (81) Designated States: AU, CA, FI, NZ, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>	
(54) Title: POST FOAMING SHAVING GEL COMPOSITION (57) Abstract A post-foaming shaving gel composition including a soap including a fatty acid and a base material, a volatile liquid post-foaming agent, a silicone copolymer surfactant, and water, characterized in that the composition is essentially free of secondary non-ionic surfactants.		

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POST FOAMING SHAVING GEL COMPOSITION

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TECHNICAL FIELD

The present invention relates to post-foaming shaving gel compositions absent a secondary non-ionic surfactant having excellent skin conditioning properties.

BACKGROUND OF THE INVENTION

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The practice of removing hair from the body extends back through recorded history. A number of different methods to remove hair have been used. Shaving hairs or whiskers off at skin level using a sharpened blade, or razor, is probably the best known of such methods.

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Topical compositions, or shaving aids are continually being developed not only to make shaving easier, but, to achieve a closer, less skin irritating shave. One such composition is a shaving cream. Shaving creams are used particularly by men for removing beard growth from their faces; aerosol shaving creams being the best known. Aerosol shaving creams, usually packaged in

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pressurized metal cans, are white, voluminous, creamy foams, are disclosed in U.S. Patents 3,330,730, Hernandez, issued July 11, 1967; 3,655,865, Murphy, issued April 11, 1972 and 3,923,970, Breuer, issued December 2, 1975.

25

A relatively recent shaving composition is the post-foaming shaving gel. These compositions are designed to be dispensed from the can as a clear, translucent gel, which is converted to a foam when rubbed into the palm or against the face. Such compositions are described in patents U.S. 3,541,581, Monson, issued November 17, 1970; U.S. 4,528,111, Su, issued July 9, 1985; U.S. 4,957,732, Grollier et al., issued September 18, 1990; U.S. 5,034,220, Helioff et al, issued July 23, 1991; British patent applications GB 1,279,145, published June 28, 1972 and GB 1,444,334, published July 28, 1976; and PCT Application WO 91/07943, Chauduri, published June 13, 1991; all herein incorporated by reference.

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Since shaving, particularly daily shaving, can irritate the skin around the neck and face manufacturers of the shaving compositions often add ingredients to minimize skin irritation, and impart good skin feel both during and after shaving. These ingredients include humectants, emollients, and moisturizers. Such ingredients include aloe, menthol, lanolin, yucca, silicones, and other ingredients known for use in cosmetic compositions. Additional ingredients may be added to impart therapeutic benefits to the skin. These ingredients include antiseptics for treating razor cuts and nicks.

It is known in the art that silicone oils form a protective coating on the skin by filling the crevices and follicular openings of the skin. This protective coating reduces water loss through the stratum corneum and avoids tightening of the skin. Silicones are also thought to fill the cracks and crevices in the skin, resulting in skin smoother to the touch. Therefore, shaving compositions containing silicones not only reduce razor friction, but benefit the skin as well. Silicone oils, however, are typically difficult to incorporate into typical shaving compositions due their relative hydrophobicity. Therefore, in order to incorporate silicones into a typical aqueous-based shaving compositions, they must be modified to increase their hydrophilicity.

The preferable form silicones take when incorporated in shaving compositions are actually silicone polymers having acyloxyalkyl groups attached to the silicone backbone. These silicone copolymers, or polyorganosiloxanes, are hydrophilic non-ionic surfactants which can be easily incorporated into aqueous-based shaving composition. Silicone copolymer nonionic surfactants are disclosed in the art. Dow Corning's publication, A Unique Marketing Proposition, copyrighted 1987, discloses using Dow Corning 193 Dimethicone Copolyol (a dimethicone copolyol) in shaving creams. U.S. Patent 5,034,220, Helioff et al. discloses using non-volatile polyethersiloxane copolymers, in shaving compositions for lubricating and protecting the skin during

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shaving. PCT Application WO 91/07943 discloses using polysiloxane polyether copolymers, i.e. dimethicone copolyols, in a shaving gel to improve the clarity and brightness of the gel.

5 The above mentioned art discloses adding a second non-ionic surfactant to shaving gels containing the silicone copolymer surfactant. The secondary non-ionic surfactant stabilizes the gel and improves the foam consistency of the lather created when the gel is rubbed onto the face. Furthermore, these secondary non-ionic emulsifiers act as wetting agents, thereby promoting
10 good rinsing of the shaving lather from the razor and the skin. Typical secondary non-ionic surfactants include Oleth-10, Oleth-20, Ceteth-10, Ceteth-20; see PCT Application WO 91/07943.

SUMMARY OF THE INVENTION

The present invention is a post-foaming shaving gel composition comprising soap, a volatile liquid post-foaming agent, a silicone
15 copolymer surfactant, and water, wherein the improvement is the removal of essentially all of the secondary non-ionic surfactant. Despite lacking a secondary non-ionic surfactant, these gel compositions have surprisingly good gel and foam stability.
20 Furthermore, the shave gels of the present invention cause less skin irritation, and provide excellent skin conditioning benefits. These shaving gel compositions may additionally comprise known cosmetic ingredients including, but not limited to, gellants, humectants, emollients, colorings, and fragrances to improve the
25 overall acceptability of the composition.

All the components disclosed herein are, unless specified otherwise, expressed as percent by total weight of the composition.

DETAILED DESCRIPTION OF THE INVENTION

30 The shaving gel compositions of the present invention comprises ingredients commonly known in the art. The following is a detailed description the components comprising the present invention.

Soaps

35 Soaps are a necessary component in forming the gel structure

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of the present invention. Furthermore, since these soaps are wetting agents, they provide excellent shaving conditions. The soaps used in the present invention are water soluble salts of higher fatty acids formed by combining fatty acids and base materials.

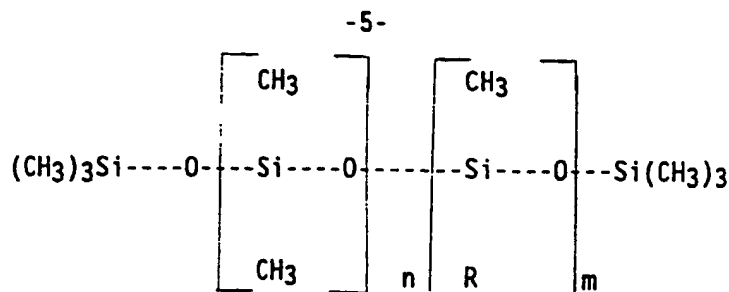
Fatty acids are used at levels from about 5% to about 35%, preferably 5% to about 20%, and most preferably from about 8% to about 16%. The fatty acids used herein are selected from the group consisting of C₁₀-C₂₄ fatty acids. Examples of these fatty acids include stearic, palmitic, myristic oleic, coconut oil, soya oil fatty acids, and mixtures thereof. Preferred are stearic, myristic, and palmitic acids. Most preferred are the stearic and palmitic acids. The level of base material used is from about 2% to about 18%, preferably from about 2% to about 10%, and most preferably from about 4% to about 8%, wherein the ration of the fatty acids to base material is about 4:1, preferably about 3:1 and most preferably about 2:1. The base materials are selected from the group consisting of mono-, di- and triethanolamine, iso-propanolamine, potassium hydroxide, sodium hydroxide, and mixtures thereof. Preferred are mono-, di-, and triethanolamine, most preferred is triethanolamine.

Therefore, the resulting soaps most preferred in this invention are palmitate soaps, stearate soaps, and combinations of palmitate and stearate soaps made by the reaction of triethanolamine with the respective fatty acid. The combination of soaps is from 1:5 to 5:1, preferably from 1:3 to 3:1, and most preferably from 3:1 palmitate to stearate.

All the above mentioned soaps may be prepared by any of the means known in the art.

Silicone Copolymer Surfactant

The silicone copolymer surfactants of the present invention are used at levels from about 0.2% to about 6%, preferably from about 0.5% to about 4%, and most preferably from about 1% to about 3%. Said silicone copolymer surfactants correspond to the formula



wherein R is $(\text{CH}_2)_3\text{-O-(C}_2\text{H}_4\text{O)}_x\text{-(C}_3\text{H}_6\text{O)}_y\text{-H}$ and the value of x is from 0 to about 50, preferably 8 to about 12, and most preferably about 10; the value of y is from 0 to about 50, preferably from 0 to about 2, and most preferably 0; the value of n is from about 1 to about 500, preferably from about 20 to about 90, and most preferably about 40; the value of m is from about 1 to about 10, preferably from about 2 to about 8, and most preferably about 5; a HLB value of from about 8 to about 20, preferably from about 10 to about 15, most preferably about 12.5; and a molecular weight from about 2,000 to about 50,000, preferably from about 3,000 to about 10,000, and most preferably about 3,100. Such silicone materials are disclosed in PCT Application WO 9107943, herein incorporated by reference, and are available as Dow Corning 193 Surfactant, from Dow Corning Corporation, Midland Michigan; and G.E. Silicone 218-1132, available from the General Electric Co., Silicone Products Division Waterford, New York.

Volatile Liquid Post-Foaming Agent

Volatile liquid post-foaming agents in the present invention transforms the gel into a foam by rapidly volitalizing upon rubbing the gel on the skin. The level of the liquid volatile post-foaming agents in the present invention is from about 1% to about 5%, preferably from about 2% to about 4%, and most preferably from about 2% to about 3%.

Liquid volatile foam-forming agents are known in the art and are disclosed in British Patent Application 1,279,145 published June 28, 1972, herein incorporated by reference. Such agents are liquids or liquifiable saturated aliphatic hydrocarbons having from about 4 to 6 carbon atoms, such as n-pentane, isopentane, n-butane, isobutane, n-propane, isopropane, and mixtures thereof.

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In the present invention, isopentane and isobutane are preferred. Most preferred is a mixture of about 85% isopentane and about 15% isobutane. These volatile liquids may be supplemented with other volatile liquids or compressed non-liquified gases, commonly referred to as propellents, in order to assist in expulsion of the gel from the can. Such propellents are disclosed in British Patent Application 1,444,334 published March 26, 1976; herein incorporated by reference.

Water

Water is typically used to form shaving gel compositions. There are no special requirements for the water used, except it must adequately solubilize the soap contained in the gel composition.

The level of water depends on what will produce an acceptable gel at typical temperatures the gel is used at, and the other ingredients that go into the formula. In this invention, water is added in a sufficient amount to Q.S. the formulation to 100%. Typically, the level of water is from about 60% to about 75% of the gel composition.

Optional Components

The shaving gel of the present invention may contain various components making the composition more acceptable to the consumer. Many of the components known in the art may be used in conjunction with the present invention.

a. Gellants

Gellants may be included in the shaving gel formulation of the present invention. These gellants, particularly those derived from cellulosic materials, improve the consistency of the gel and its thermal stability, and provides increased lubricity to the foam.

Gellants, and their levels, are selected by their ability to adjust the viscosity of the composition. Viscosity is adjusted up or down in order to provide the gel with body, but not so much as to make it difficult to spread over the face. The viscosity also is critical for keeping the post-forming agent into the gel.

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The gel composition of the present invention have viscosities between about 15,000 cps and about 60,000 cps, preferably from about 20,000 cps to about 40,000 cps. Said viscosity is measured with a cone and plate viscometer such as a Wells Brookfield
5 Viscometer, which is run at 1 RPM with a S₂ spindle.

To achieve the above viscosities, gellants are used in the present invention in amounts up to about 2%, but preferably, no greater than 1%. These gellants are selected from the group consisting of alkyl glycols, polyacrylic acids, alkyl modified
10 cellulose polymers, guar gums, xantham gums, and mixtures thereof. Preferred gellants in the present invention are alkyl modified cellulose polymers, specifically those selected from the group consisting of methylcellulose, ethylcellulose, hydroxybutyl
15 methylcellulose, hydroxy ethylcellulose, hydroxy propylcellulose, hydroxypropyl methylcellulose cellulose, and mixtures thereof. Most preferred in the present invention are hydroxy ethylcellulose, hydroxy propylcellulose, hydroxypropyl
20 methylcellulose, and mixtures thereof. Such gellants are available from Dow Chemical USA.

In addition to these cellulosic materials other traditional gellants preferred for use herein include the alkyl glycols, specifically polyethylene glycol.

b. Emollients

Emollients used in the present invention provide a source of
25 lipids to replace those lost during shaving. They also may be used to soften whiskers to make them easier to cut, and scavenge for irritating basic materials in the gel matrix.

Emollients may be used in the present at levels from about 1% to about 5%, preferably from about 2% to about 4%, most preferably
30 at about 2.75%. The emollients selected are those generally known in the art and can be found in a number of cosmetic formularies such as Harry's Cosmetology, Edited by Wilkinson and Moore, 7th Ed. 1982. The emollients useful in the present invention include glycol esters. The glycol esters are selected from the group
35 consisting of propylene glycol monoisostearate, propylene glycol

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dipelargonate, propylene glycol oleate, propylene glycol myristate, and mixtures thereof. Most preferred is propylene glycol monoisostearate.

c. Humectants

5 Humectants may be included in the gel formulation of the present invention. Humectants serve to bind water thus reducing the tendency of the gel's foam to dry out and collapse. Humectants may be used at levels from about 2% to about 12%, preferably from about 5% to about 7%, most preferably at 6%.
10 Humectants useful in the present invention are those generally known in the art and can be found in a number of cosmetic formularies such as Harry's Cosmetology, Edited by Wilkinson and Moore, 7th Ed. 1982. The humectants useful in the present invention include polyhydric alcohols selected from the group
15 consisting of ethylene glycol, propylene glycol, butylene glycol, glycerin, and sorbitol. Most preferred in the present invention are sorbitol and propylene glycol.

d. Colorants

20 Colorants may be added to compositions of the present invention. The colorants should be used in very low levels to avoid staining the skin or towels. In the present invention, dyes are used at levels from about 0.1% to about 0.4% of a 0.5% solution of dye, preferably about 0.2%. Dyes or colorants include any of those approved for use such as D&C or FD&C dyes; for
25 example FD&C Blue #1.

e. Fragrance

Fragrances may be added to the gel composition of the present invention. The level of fragrance used is dictated by the aesthetic affect sought by the formulator. In the present
30 invention, the level of fragrance may be as high as about 1%, preferably no more than 0.5%. These fragrances or perfumes should be compatible with water-soluble soaps.

f. Miscellaneous Ingredients

35 The shaving gel of the present invention is not limited to the ingredients above. Other ingredients can be added as deemed

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appropriate by the formulator. Such ingredients include preservatives, cooling agents corrosion inhibitors, bacteriostats, pilmotor agents, and other ingredients found in shaving compositions known in the art.

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EXAMPLES

Shaving gel compositions:

		<u>Weight</u>			
		<u>Example</u>			
	<u>Component</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>
10	Triethanolamine	6.00	6.00	7.00	5.40
	Palmitic Acid	0.00	13.00	7.00	7.20
	Stearic Acid	13.00	0.00	7.00	2.40
	Silicone Copolymer Surfactant*	1.00	2.00	1.00	2.00
	Propylene Glycol Monoisostearate	2.50	2.75	1.80	2.75
15	Polyethylene Glycol 600,000**	0.25	0.40	0.20	0.25
	Sorbitol (70%)	8.00	6.00	2.00	4.00
	Propylene Glycol	2.00	2.00	8.00	2.00
	Hydroxypropylcellulose***	0.05	0.10	0.08	0.075
	Color Solution (FD&C Blue #1@.5%)	0.20	0.20	0.20	0.20
20	Fragrance	0.35	0.35	0.35	0.35
	Isopentane	2.34	1.53	2.55	1.87
	Isobutane	0.41	0.27	0.45	0.33
	Water Q.S. to 100%				

* GE Silicone 218-1132, available from the General Electric Co. Silicone Products Division; and Dow 193 available from the Dow Corning Company

** Polyoy WSR-N-205, available from Amerchol Corp.

***Klucel-HF, available from the Aqualon Company

30 The compositions above are made according to the following method:

Add approximately 70% water and the polyethylene glycol to a jacketed vessel. Heat the mixture to about 70°C, and add the silicone copolymer surfactant, palmitic acid, stearic acid, sorbitol, propylene glycol, and propylene glycol monoisostearate, stirring the

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mixture until it is smooth. Add in separate steps with stirring, hydroxypropylcellulose and triethanolamine. After the mixture is uniform, cool the mixture to about 45°C. Add the fragrance and cool the mixture to about 30°C. Add isopentane and isobutane, and Q.S. the mixture to 100% with water.

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CLAIMS:

1. A post-foaming shaving gel composition including a soap including a fatty acid and a base material, a volatile liquid post-foaming agent, a silicone copolymer surfactant, and water, characterized in that the composition is essentially free of secondary non-ionic surfactants.

2. A post-foaming shaving gel composition including:

- from 5% to about 35%; preferably, 5% to 20%; more preferably, 8% to 16% of a fatty acid;
- from 2% to 18%; preferably, 2% to 10%; more preferably, 4% to 8% of a base material;
- from 0.2% to 6%; preferably 0.5% to 4%; more preferably, 1% to 3% of a silicone copolymer surfactant;
- from 1% to 5%; preferably, 2% to 4%; most preferably, 2% to 3% of a volatile liquid post-foaming agent; and
- water;

characterized in that the composition is essentially free of a secondary nonionic surfactant, and the ratio of fatty acid to base material is from 2:1 to 4:1.

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3. A post-foaming shaving gel composition according to any one of the above claims characterized in that the fatty acid is selected from the group of C₁₀-C₂₄ fatty acids; preferably the fatty acid is selected from the group consisting of palmitic acid, stearic acid, myristic acid, oleic acid, coconut oil fatty acid, soya oil fatty acid, and mixtures thereof; and more preferably the fatty acids are selected from the group consisting of palmitic acid, stearic acid, myristic acid, and mixtures thereof.

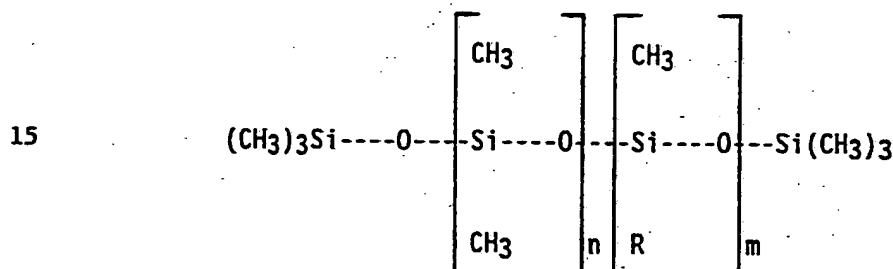
4. A post-foaming shaving gel composition according to any one of the above claims characterized in that the base material is selected from the group consisting of mono-, di- and triethanolamine, iso-propanolamine, potassium hydroxide, sodium hydroxide, and mixtures thereof.

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5. A post-foaming shaving gel composition according to any one of the above claims characterized in that the volatile liquid post-foaming agent is selected from the group consisting of n-pentane, isopentane, n-butane, isobutane, n-propane, isopropane, and mixtures thereof; preferably the volatile liquid post-foaming agent is a mixture of about 85% isopentane to about 15% isobutane.

6. A post-foaming shaving gel composition according to any one of the above claims characterized in that the silicone copolymer surfactant is a polysiloxane polyether copolymer corresponding to the formula



wherein R is $(\text{CH}_2)_3\text{-O-(C}_2\text{H}_4\text{O)}_x\text{-(C}_3\text{H}_6\text{O)}_y\text{-H}$ and the value of x is from 0 to 50; preferably, 8 to 12; the value of y is from 0 to 50; preferably 0 to 2; the value of n is from 1 to 500; preferably, 20 to 90; the value of m is from 1 to 10; preferably, 2 to 8; the HLB value is from 8 to 20; preferably 10 to 15; and the molecular weight is from 2,000 to 50,000; preferably, 3,000 to 10,000.

7. A post-foaming shaving gel composition according to any one of the above claims, further characterized by gellants, preferably at a level up to 20%; emollients, preferably at a level from 1% to 5%; and humectants, preferably at a level from 2% to 12%.

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8. A post-foaming shaving gel composition according to Claim 7 characterized in that the gellants are selected from the group consisting of methylcellulose, ethylcellulose, hydroxybutyl methylcellulose, hydroxy ethylcellulose, hydroxy propylcellulose, hydroxypropyl methylcellulose cellulose, and mixtures thereof.

9. A post-foaming shaving gel composition according to Claim 7 or 8 characterized in that the emollients are glycol esters selected from the group consisting of propylene glycol monoisostearate, propylene glycol dipelargonate, propylene glycol oleate, propylene glycol myristate, and mixtures thereof.

10. A post-foaming shaving gel composition according to Claim 7, 8 or 9 characterized in that the humectants are polyhydric alcohols selected from the group consisting of ethylene glycol, propylene glycol, butylene glycol, glycerin, and sorbitol.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 93/02782

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl. 5 A61K7/15		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	A61K	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	WO,A,9 107 943 (THE GILLETTE COMPANY) 13 June 1991 cited in the application see the whole document ---	1-10
A	DE,A,1 467 863 (DOW CORNING CORP.) 9 January 1969 see the whole document ---	1-10
A	FR,A,1 428 054 (THE J.B. WILLIAMS COMPANY INC.) 3 January 1966 see the whole document -----	1-10
<p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search 25 JUNE 1993		Date of Mailing of this International Search Report 0 8. 07. 93
International Searching Authority EUROPEAN PATENT OFFICE		Signature of Authorized Officer FISCHER J.P.

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

US 9302782
SA 72724

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO-A-9107943	13-06-91	AU-A- 7172091 EP-A- 0503004	26-06-91 16-09-92
DE-A-1467863	09-01-69	GB-A- 998706 US-A- 3298919	
FR-A-1428054		None	

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